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SERIAL NO. 09/281,710
GROUP: 2800

Response
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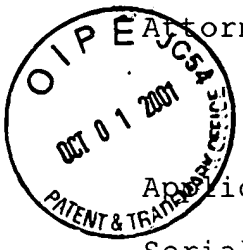

Attorney Docket No. 990204/LH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Hideyuki OMURA at al

Serial No. : 09/281,710

Filed : March 30, 1999

For : EXTERNAL CAVITY LASER

Art Unit : 2881

Examiner : C. Jackson

Approved for Entry CRJ

RESPONSE AFTER FINAL REJECTION
EXPEDITED PROCEDURE-EXAMINING GROUP 2800

Assistant Commissioner for Patents
Washington, D.C. 20231

S I R :

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Angella Johnson
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In the event that this Paper is late filed, and the necessary petition for extension of time is not filed concurrently herewith, please consider this as a Petition for the requisite extension of time, and to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this Paper to Account No. 06-1378.

This is responsive to the Final Office Action mailed July 2, 2001, the term for response to which expires on October 2, 2001.

Reconsideration of this application is respectfully requested.

The July 2, 2001 Office Action and the Examiner's comments have been carefully considered. In response, remarks are set forth below to point out some of the patentable features of the present claimed invention which define the present claimed invention over the cited references.

INTERVIEW

The courtesy of Examiner Jackson in granting an interview in connection with this application with applicants' representative, Robert Michal, is acknowledged and appreciated. During the interview the present claimed invention as defined by claim 1 was discussed along with the cited references. Unfortunately agreement was not reached between the Examiner and applicants' representative.

PRIOR ART REJECTIONS

In the Office Action claims 1 and 4-10 are rejected under 35 USC 103(a) as being unpatentable over the article entitled "Characteristics of Modulation Distortion of Fiber-Grating External-Cavity-Laser" (Hamakawa et al) in view of USP 5,892,781 (Pan et al).

According to the present claimed invention as defined by claim 1, the external cavity laser includes a FBG (Fiber Bragg Grating) section (20) provided on an optical path between a laser light emitting device (10) and a (first) connector (30), and intercepting means (27) provided on the optical path between the FBG section (20) and the (first) connector (30). This arrangement prevents light which is provided by the laser light emitting device from being returned from the connector through the FBG section toward the external cavity formed between a

reflection surface of the laser light emitting device and the FBG section, thereby reducing the relative intensity of noise (RIN). It is respectfully submitted that this structure is not disclosed, taught or suggested by Hamakawa et al or Pan et al, taken either alone or in combination.

In the Office Action the Examiner states that all of the claimed elements are shown in Hamakawa et al except for intercepting means and its location. However, the Examiner states that Pan et al teach intercepting means 14 for intercepting reflected waves from a connector 15 wherein the intercepting means is located in the optical path between a first Bragg grating section and the connector.

It is pointed out, as recognized by the Examiner, that Hamakawa et al does not disclose an intercepting means. In addition, it is pointed out that although Pan et al do disclose an isolator, Pan et al do not indicate relative placement of the connector and isolator. Pan et al fail to disclose, teach or suggest a RIN reduction effect achieved by the prevention of return light from a connector, as is achieved with the present claimed invention.

Still further, it is pointed out that in Pan et al the cavity is formed between FBG sections (11A and 11B), and that a semiconductor laser device (laser light emitting device) is employed as the excitation light source. It is respectfully

submitted that the structure disclosed in Pan et al do not at all suggest forming part of an external cavity by means of a laser light emitting device according to the present claimed invention as recited in claim 1.

The Examiner incorrectly asserts that one of couplers/isolators of Pan et al can be regarded as a connector and that another coupler/isolator 14 corresponds to the intercepting means claimed in claim 1.

Referring specifically to column 5, lines 12-16 of Pan et al, the reference teaches the following:

> The optical isolators at the output of each of these coupler/isolators 14 and 15 ensure that no light at any wavelength are reflected back. Hence, a single pumping laser 18 provides the energy for both the laser 10 (60) and the amplifier 12. (Emphasis added)

It is respectfully pointed out to the Examiner that Pan et al explicitly teach that the coupler/isolators 14 and 15 of Pan is not either a coupler or isolator, but is instead a combination coupler and isolator which exhibits the characteristics of both the devices. See column 4, lines 30-47 of Pan et al and specifically lines 32-34. Column 5 of Pan states that the optical isolator is located at the output of each of the coupler/isolators 14 and 15. In the present claimed invention this would place the isolator on the side of the coupler which is distal with regard to the light emitting device 10. This teaching is contrary to the present claimed invention where the

isolator (intercepting means) is specifically defined as being located on an optical path between a fiber Bragg grating section and the connector (see claim 1, lines 24-25). The present invention is concerned with intercepting light reflected from a connector whereas Pan et al is concerned with intercepting reflected light from an unidentified source since the isolator is not positioned between the connector and the light emitting device as specifically recited in claim 1.

As stated above, the intercepting means of the present claimed invention serves to intercept reflected waves from a connector for use with an external cavity laser. This is different from the broad technical concept of Pan et al which intercepts reflected light from an unidentified source.

The present claimed invention achieves the unique effect of **reducing the noise level caused by the provision of a connector.**

Claim 1 includes the following limitations for achieving the above-mentioned advantage.

- the connector outputs the light oscillated by a cavity (line 16);
- the connector is a first connector provided on an optical path extending from a laser light emitting device (lines 17-18);
- the intercepting means intercepts reflected waves from the connector (lines 19-20); and

- the intercepting means is located on an optical path between a fiber Bragg grating section and the connector (lines 24-25).

In conclusion, applicants respectfully state that the final rejection based on Hamakawa et al and Pan et al is traversed because the references fail to disclose, teach or suggest a connector outputting the light oscillated by a cavity, the connector being the first connector provided on an optical path extending from a laser light emitting device, intercepting means on the optical path between the fiber Bragg grating section and the connector to thereby intercept the reflected waves from the connector, with the intention of reducing the noise level caused by the provision of the connector.

The structure and benefits of the present claimed invention are not disclosed, taught or suggested by the cited references, taken alone or in combination.

In view of the foregoing remarks, claim 1, and claims 4-10 which are dependent thereon, are patentable over the cited references under 35 USC 102 as well as 35 USC 103.

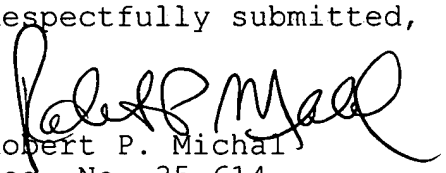
* * * *

If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

In view of the foregoing, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



Robert P. Michal
Reg. No. 35,614

Frishauf, Holtz, Goodman, Langer & Chick, P.C.
767 Third Avenue - 25th Floor
New York, New York 10017-2023
Tel. No. (212) 319-4900
Fax Nos. (212) 319-5101
RPM/sdf:ajj